tion, and would thus contribute materially to the stability of mycological nomenclature.

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SOCIETIES AND ACADEMIES

THE BIOLOGICAL SOCIETY OF WASHINGTON

THE 456th meeting was held March 6, 1909, with President Palmer in the chair. Dr. Theodore Gill offered some notes on oral gestation in cichlid fishes. He said that there was much to learn about the habits of American cichlids and especially about their buccal incubation. Professor Putnam as long ago as 1863, in the *Proceedings* of the Boston Society of Natural History (p. 226), remarked that "in the genus *Bagrus* [really *Arius*] Professor Wyman found that it was the male that took charge of the eggs, while in the Chromoids [*i. e.*, Cichlids] it is the female. The specimens in which this peculiar fact was noticed were presented to the Museum of Comparative Zoology by Rev. J. C. Fletcher, from the Rio Negro, and by Professor Wyman, from Surinam. In these specimens the eggs and young were found in all stages of development."

This statement has been universally overlooked and various authors, especially Lortet and Günther, maintained that it was the male that took charge of the eggs, and not till 1902 and later did Boulenger and Pellegrin demonstrate that it was always the female of Syrian and African cichlids that did so. There was much uncertainty about the American species and the genus comprising the "two species" observed by Putnam was not named. It was probably *Geophagus*.

Very recently, in an article on the "Freshwater Fishes of French Guiana" extracted from the *Revue Coloniale*, Dr. Pellegrin claimed that it was the male of the American *Geophagi* that nurses the eggs; his words are "Chez les Géophages américains c'est le mâle qui se charge ainsi des soins à donner aux œufs et aux jeunes; chez les Cichlides africains comme les Tilapies, c'est la femelle ainsi que M. Boulenger et moi l'avons montré."

It is improbable that the American species differ so decidedly from the African and the neglected half-century-old observations of Wyman and Putnam deserve resurrection. Perhaps the specimens observed are still in the Museum of Comparative Zoology and can be identified by Mr. Garman or Professor Eigenmann. Agassiz in his "Journey to Brazil" in 1865 made some observations but did not state whether the egg-carrying individuals were females or males.

Now that much attention is being paid to the breeding habits of fishes, we may hope that definite observations will soon be made of American cichlids. Some, indeed, have been published by German aquarists which appear to show that there may be considerable difference in the habits of the species, but the information is still unsatisfactory. May this note serve to elicit more definite data.

Dr. L. O. Howard referred to the importation of the brown tail moth accompanying seedlings from France. It is a practise of American nurserymen to buy seedlings from the north of France. Thirty per cent. of a recent shipment carried the winter nests of the moth. There is no national inspection law in this country and the stock had become widely distributed before its infection was known. Much of it was later traced and destroyed under state laws. An old federal law forbids the carrying of such infected stock in vessels, and steamship companies after a warning are now more careful in this respect. A protest from the French nurserymen alleged that the brown tail moth would not thrive in our northern states, and was already common in the southern states. But the fact is that in this country the moth is a great pest in the northern states to which it is confined.

The chair referred to the reservation by executive proclamation under the Monuments Act of several regions containing objects of scientific interest. The recent creation by President Roosevelt of the Mt. Olympus National Monument in the Olympic Mountains of Washington, the home of the Roosevelt elk, is the first of its kind having a zoological as well as geological interest.

Dr. Evermann called attention to a recent act of Congress which provides for the establishment of a biological station at Fairport, Iowa. An appropriation of $25,000 for the establishment of this station was made a year ago and recently Congress passed the item providing for the personnel. The site has been definitely selected at Fairport, Iowa, where the bureau has acquired sixty acres of land admirably suited to the purpose. About fifty acres of the land lies along the river front and is exceedingly well adapted to the construction of the necessary ponds, of which there will be several acres. Near the river front is a railroad used by two companies with a number of trains each way daily, thus affording adequate railroad facilities. Some 1,800 feet from the river front is a public highway connecting

Muscatine and Davenport. Just above the highway the ground rises into a low bluff near the base of which are beautiful locations for the director's residence and such other residences as may be required. The laboratory proper will doubtless be located on the lower land just below the public highway.

It is the intention of the Bureau of Fisheries to make this in every respect a well equipped biological laboratory where any and all problems concerning the aquatic life of the streams and lakes of the upper Mississippi Valley may be studied. The primary and most important purpose of the station will be the carrying on of experiments and actual culture in connection with the artificial propagation of the Unionidæ or fresh-water mussels. The shells of various species of fresh-water mussels are now being used extensively in the manufacture of pearl buttons. The industry centers at Muscatine and Davenport, between which two cities the biological station will be located. The business now utilizes more than 50,000 tons of these shells and produces an output of $6,000,000 worth of buttons and by-products annually. Naturally this heavy drain upon the supply of shells will soon lead to the depletion of the beds unless something can be done toward the artificial propagation of the species. Drs. Lefevre and Curtis, of the University of Missouri, have fortunately developed, purely through scientific investigation, methods by which several of the species can be propagated very successfully, and it is the intention to carry on mussel-cultural work of this kind very extensively at the Fairport station.

In addition, however, to the mussel-cultural work, it is the intention to equip this laboratory in such a way as to furnish adequate facilities for the study of the various species of fishes and other aquatic animals and aquatic plants of the upper Mississippi basin, and it is believed that this will appeal to the biologist of that region as well as of the entire country.

The personnel provided consists of (*a*) director, (*b*) superintendent of fish-culture, (*c*) two scientific assistants, (*d*) one shell expert, (*e*) one engineer, (*f*) two firemen and (*g*) two laborers. Construction work on the station will begin early in July and it is hoped that the station may be ready for work by November.

The following communications were presented:

Chickens without Feathers: R. H. CHAPMAN.

Illustrations were shown of fowls that had failed in normal feather development. The birds were observed at Delhi, N. Y., during the summer of 1908. About 500 chicks of the barred Plymouth Rock variety were incubator hatched during June. They were all apparently normal for a short time, but about ten per cent. failed to grow the usual covering. The photographs shown were taken in November and the birds were about four months old, and included the fully feathered as well as naked birds. The death rate among the freaks was high, though some of them lived until the cold weather set in. The only clew to an explanation given was the fact that the parents of the chicks had been persistently inbred for some four years. The phenomenon has been previously observed at farms in Virginia but never in such a large proportion of the hatching.

Résumé of a Study of the Madreporaria of the Hawaiian Islands: T. WAYLAND VAUGHAN.

The Recent Crinoids and their Relation to Sea and Land: A. H. CLARK.

The speaker discussed the distribution, ecology and coloration of the recent crinoids, following closely his paper on the subject published in the *Geographical Journal* (London) for December, 1908; he said further that the predominating purple or violet in the littoral species may be a factor of great importance in their economy, for many of the small organisms upon which they feed are strongly attracted by the violet rays of the spectrum, and hence would tend to swim toward a purple or violet crinoid, placing the latter in the economically advantageous attitude of attracting to itself, instead of having to pursue its food. *Uintacrinus* was cited as an instance of a purely pelagic derivative from the common comatulid stock; in life it probably floated with its globular body upward and its arms dependent downward, just like the similarly built jelly-fish of recent seas; it lived in great masses, as do many recent medusæ, and this was probably an advantage, for these masses would shade the water immediately beneath them, and many of the small lucifugous organisms would take refuge in this shade, only to be picked up and eaten by the *Uintacrinus*. The occurrence of crinoids in large masses of individuals all of which are of approximately the same size was explained by the inability of the young of the mass to obtain a food supply when shaded by the arms of the adults; hence the young can not survive unless drifted to some distance from the parents.

The 457th meeting was held March 20, 1909, with President Palmer in the chair. The program consisted of an illustrated discussion of "Camp-

ing and Camp Outfits," by A. S. Hitchcock, V. Bailey, H. S. Barber, W. H. Osgood, J. W. Gidley and E. A. Preble. Articles of camp equipment were exhibited, methods of carrying packs demonstrated, and many lantern slides shown.

M. C. Marsh,
Recording Secretary

THE PHILOSOPHICAL SOCIETY OF WASHINGTON

The 663d meeting was held March 27, 1909, Vice-president Wead in the chair. Two papers were read.

The Present Status of Wireless Telegraphy and Telephony: Dr. L. W. Austin, of the Bureau of Standards.

Two years ago there were four principal practical problems before the workers in radiotelegraphy:

1. Doing away with the irregularities of the atmospheric absorption of the signals which caused waves of the same intensity to be at one time detected at a distance of 1,000 miles, at another not over 100.

2. The elimination of the disturbances in the receiving station due to atmospheric discharges which frequently made the reception of signals entirely impossible.

3. The production of directed signals capable of commercial use.

4. The production of electrical oscillations suitable for wireless telephony.

The first of these problems has been successfully attacked by Professor Fessenden, who has shown that by using a wave-length of approximately 4,000 meters the absorption is much reduced and becomes practically constant under all conditions both by day and night.

The second problem is still not satisfactorily solved, although the conditions are much improved by sharper tuning of the receiving circuits and especially by the use of a loose coupling of the receiver.

In regard to the third problem, a certain amount of success has attended the experiments of Marconi, who by using a bent antenna has succeeded in giving direction to the electrical waves. Bellini and Tossi in France have also obtained very satisfactory results by the use of a kind of loop antenna.

In wireless telephony, continuous trains of oscillations produced either by the arc or by means of high-frequency dynamos have been so far improved that the range of working has been increased from about 10 miles to over 200.

A Calorimeter for the Determination of the Specific Heat of Liquids: Mr. H. C. Dickinson, of the Bureau of Standards.

A Dewar flask of the ordinary spherical form, of five liters' capacity, has been adapted for use directly as a calorimeter for measuring the specific heat of liquids. The particular problem attacked has been the measurement of the specific heat of calcium chloride solutions at low temperatures. For this purpose the flask is immersed in a mixture of ice and water and filled with the solution to be tested, cooled to the lowest temperature its concentration will permit.

The method consists in accurate measurements of the temperature of the weighed contents of the flask, alternating with short periods during which energy is supplied electrically to raise the temperature of the liquid. The temperature is raised by steps of about 5° C. and the energy supplied, and the corresponding rises of temperature are measured for each 5° interval. Such a series of observations with a single sample of solution, occupying about one and a half hours, gives a specific heat for intervals of 5°, between −30° C. and +20° C.

The water equivalent and radiation constant for the calorimeter were determined with great care by a separate series of experiments, using pure water. The water equivalent of the calorimeter, stirrer, thermometer, etc., is only about 2 per cent. of the total water equivalent of the solution used.

The total correction for radiation with a temperature difference of 30°, amounts to only about two per cent. of the energy supplied.

The energy, supplied electrically, is measured to about 2 parts in 10,000 by means of a potentiometer in connection with a standard 0.1-ohm shunt and a volt box.

Temperature differences are measured by means of a resistance thermometer having a sensibility of about 0°.0005 C.

The time intervals necessary in computing the total energy are measured by means of a tape chronograph to about 0.02 second.

The following table gives the values found for the specific heat of solutions of chemically pure calcium chloride and water of different densities, where t is the temperature in degrees C.:

Density	Specific Heat	Temperature
1.07	$0.869 + 0.00057\,t$	(−5° to +15°)
1.14	$0.773 + 0.00064\,t$	(−10° to +20°)
1.20	$0.710 + 0.00064\,t$	(−20° to +20°)
1.26	$0.662 + 0.00064\,t$	(−25° to +20°)

R. L. Faris,
Secretary